General

Guideline Title

Operative vaginal delivery.

Bibliographic Source(s)

Royal College of Obstetricians and Gynaecologists (RCOG). Operative vaginal delivery. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2011 Jan. 19 p. (Green-top guideline; no. 26). [99 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Royal College of Obstetricians and Gynaecologists (RCOG). Operative vaginal delivery. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2005 Oct. 13 p. (Guideline; no. 26).

Recommendations

Major Recommendations

In addition to these evidence-based recommendations, the guideline development group also identifies points of best clinical practice in the original guideline document.

Classification of evidence levels (1++ to 4) and grades of recommendations (A-D) are defined at the end of the "Major Recommendations" field.

Preparation for Operative Vaginal Delivery

Can Operative Vaginal Delivery Be Avoided?

A - All women should be encouraged to have continuous support during labour as this can reduce the need for operative vaginal delivery.

A - Use of upright or lateral positions and avoiding epidural analgesia can reduce the need for operative vaginal delivery.

A - Delayed pushing in primiparous women with an epidural can reduce the need for rotational and midcavity deliveries.

How Should Operative Vaginal Delivery Be Classified?

D - A standard classification of operative vaginal delivery should be used.

When Should Operative Vaginal Delivery Be Offered?

B - Operators should be aware that no indication is absolute and should be able to distinguish 'standard' from 'special' indications.

D - A vacuum extractor should not be used at gestations of less than 34 weeks +0 days. The safety of vacuum extraction at between 34 weeks +0 days and 36 weeks +0 days of gestation is uncertain and should therefore be used with caution.

Operative intervention is used to shorten the second stage of labour. It may be indicated for conditions of the fetus or of the mother (see Table 2 in the original guideline document). The benefits of a shortened second stage for certain medical conditions should be discussed where possible in the antenatal period. The time constraints listed in Table 2 in the original guideline document are for guidance. The question of when to intervene should involve balancing the risks and benefits of continuing pushing versus an operative delivery. [Evidence level 2-]

What Are the Essential Conditions for Safe Operative Vaginal Delivery?

D - Safe operative vaginal delivery requires a careful assessment of the clinical situation, clear communication with the mother and healthcare personnel and expertise in the chosen procedure.

The table below lists prerequisites for operative vaginal delivery. Like any operative intervention, adequate preparation and planning is important. Be cautious in the urgent situation and at handover periods when time pressures can limit the information given.

Table: Prerequisites for Operative Vaginal Delivery

Full Abdominal and Vaginal Examination	Head is ≤1/5th palpable per abdomen Vertex presentation Cervix is fully dilated and the membranes ruptured. Exact position of the head can be determined so proper placement of the instrument can be achieved. Assessment of caput and moulding Pelvis is deemed adequate. Irreducible moulding may indicate cephalo-pelvic disproportion.
Preparation of Mother	Clear explanation should be given and informed consent obtained. Appropriate analgesia is in place for mid-cavity rotational deliveries. This will usually be a regional block. A pudendal block may be appropriate, particularly in the context of urgent delivery. Maternal bladder has been emptied recently. In-dwelling catheter should be removed or balloon deflated. Aseptic technique
Preparation of Staff	Operator must have the knowledge, experience and skill necessary. Adequate facilities are available (appropriate equipment, bed, lighting). Back-up plan in place in case of failure to deliver. When conducting mid-cavity deliveries, theatre staff should be immediately available to allow a caesarean section to be performed without delay (less than 30 minutes). A senior obstetrician competent in performing mid-cavity deliveries should be present if a junior trainee is performing the delivery. Anticipation of complications that may arise (e.g., shoulder dystocia, postpartum haemorrhage) Personnel present that are trained in neonatal resuscitation

Performing Operative Vaginal Delivery

Who Should Perform Operative Vaginal Delivery?

D - An operative vaginal delivery should be performed by an operator who has the knowledge, experience and skills necessary to assess and to use the instruments and manage complications that may arise.

Where Should Operative Vaginal Delivery Take Place?

C - Operative vaginal births that have a higher risk of failure should be considered a trial and conducted in a place where immediate recourse to caesarean section can be undertaken.

Higher rates of failure are associated with:

- Maternal body mass index over 30
- Estimated fetal weight over 4000 g or clinically big baby
- Occipito-posterior position
- Mid-cavity delivery or when 1/5th of the head palpable per abdomen.

The risks of failed operative vaginal delivery in the labour room should be balanced with the risks associated with the transfer time when the delivery is conducted in an operating theatre. [Evidence levels 2- to 4]

What Instruments Should Be Used for Operative Vaginal Delivery?

A - The operator should choose the instrument most appropriate to the clinical circumstances and their level of skill. Forceps and vacuum extraction are associated with different benefits and risks. Failed delivery with selected instrument is more likely with vacuum extraction.

When Should Operative Vaginal Delivery Be Abandoned?

B - Operative vaginal delivery should be abandoned where there is no evidence of progressive descent with moderate traction during each contraction or where delivery is not imminent following three contractions of a correctly applied instrument by an experienced operator.

Is There a Place for Sequential Use of Instruments?

B - The use of sequential instruments is associated with an increased risk of trauma to the infant; however, the operator must balance the risks of a caesarean section following failed vacuum extraction with the risks of forceps delivery following failed vacuum extraction.

What Is the Role of Episiotomy for Operative Vaginal Delivery?

B - In the absence of robust evidence to support routine use of episiotomy in operative vaginal delivery, restrictive use of episiotomy, using the operator's individual judgement, is supported.

Should Prophylactic Antibiotics Be Given?

A - There are insufficient data to justify the use of prophylactic antibiotics in operative vaginal delivery

Aftercare Following Operative Vaginal Delivery

Should Thromboprophylaxis Be Given?

D - Women should be reassessed after an operative vaginal delivery for risk factors for venous thromboembolism and, if appropriate, thromboprophylaxis should be prescribed.

What Precautions Should Be Taken for Care of the Bladder after Delivery?

C - The timing and volume of the first void urine should be monitored and documented.

A - Women should be offered physiotherapy-directed strategies to prevent urinary incontinence.

Urine retention with bladder overdistension should be avoided, particularly in women who have had spinal or dense epidural blocks. At a minimum the first void should be measured, and if retention is a possibility a post-void residual should be measured to ensure that retention does not go unrecognised. [Evidence level 2+]

How Can We Reduce Psychological Morbidity for the Mother?

A - There is no evidence to support the use of midwife-led debriefing in reducing maternal depression following operative vaginal delivery.

How Should We Advise Women for Future Deliveries?

B - Women should be encouraged to aim for a spontaneous vaginal delivery in a subsequent pregnancy as there is a high probability of success.

Definitions:

Grades of Recommendations

A - At least one meta-analysis, systematic review or randomised controlled trial rated as 1++ and directly applicable to the target population; *or*

A systematic review of randomised controlled trials or a body of evidence consisting principally of studies rated as 1+ directly applicable to the target population and demonstrating overall consistency of results

B - A body of evidence including studies rated as 2++ directly applicable to the target population, and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 1++ or 1+

C - A body of evidence including studies rated as 2+ directly applicable to the target population and demonstrating overall consistency of results; *or*

Extrapolated evidence from studies rated as 2++

D - Evidence level 3 or 4; *or*

Extrapolated evidence from studies rated as 2+

Good Practice Point - Recommended best practice based on the clinical experience of the guideline development group

Classification of Evidence Levels

1++ High-quality meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a very low risk of bias

1+ Well-conducted meta-analyses, systematic reviews of randomised controlled trials, or randomised controlled trials with a low risk of bias

1– Meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a high risk of bias

2++ High-quality systematic reviews of case–control or cohort studies or high-quality case–control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal

2+ Well-conducted case–control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal

2– Case–control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

3 Non-analytical studies; e.g., case reports, case series

4 Expert opinion

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

- Pregnancy
- Labour
- Childbirth

Guideline Category

Counseling

Management

Clinical Specialty

Family Practice

Internal Medicine

Obstetrics and Gynecology

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To provide up-to-date information on the use of forceps and vacuum extractor for both rotational and non-rotational operative vaginal deliveries

Target Population

Women in labour with indications for operative vaginal delivery

Interventions and Practices Considered

1. Interventions to reduce the need for operative vaginal delivery
    - Continuous support of women during labour
    - Use of upright or lateral positions and avoidance of epidural analgesia
    - Delayed pushing in primiparous women with an epidural
2. Assessment of the need for operative vaginal delivery and determination that prerequisites have been attained
3. Operative vaginal delivery through use of forceps or vacuum delivery
    - Choice of operator
    - Choice of setting for delivery
    - Choice of instruments
    - Assessment of when to abandon operative delivery
    - Use of sequential instruments
    - Restrictive use of episiotomy
4. Aftercare following operative vaginal delivery
    - Thromboprophylaxis
    - Monitoring of timing and volume of urine flow
    - Physiotherapy to prevent urinary incontinence
    - Advice for future deliveries

Note: The following interventions were considered but not recommended:

Use of prophylactic antibiotics
Use of vacuum extraction at less than 34 weeks +0 days of gestation
Use of midwife-led debriefing in reducing maternal depression following operative vaginal delivery

Major Outcomes Considered

- Rates of successful or failed operative vaginal delivery
- Maternal and fetal/neonate morbidity and mortality

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

A search of Medline and EMBASE from 2004 to 2009 and of the Cochrane Library Issue 2, 2009 was undertaken for relevant systematic reviews, meta-analyses, randomised controlled trials, and other clinical trials. The date of the last search was May 2009. The main keywords used were 'extraction, obstetrical', 'vacuum extraction, obstetrical', 'vacuum extraction, instrumental delivery', 'obstetrical forceps', 'forceps delivery', 'forceps', 'ventouse', 'labour, obstetric', 'delivery, obstetric' and 'parturition'.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Classification of Evidence Levels

1++ High-quality meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a very low risk of bias

1+ Well-conducted meta-analyses, systematic reviews of randomised controlled trials, or randomised controlled trials with a low risk of bias

1– Meta-analyses, systematic reviews of randomised controlled trials or randomised controlled trials with a high risk of bias

2++ High-quality systematic reviews of case–control or cohort studies or high-quality case–control or cohort studies with a very low risk of confounding, bias or chance and a high probability that the relationship is causal

2+ Well-conducted case–control or cohort studies with a low risk of confounding, bias or chance and a moderate probability that the relationship is causal

2– Case–control or cohort studies with a high risk of confounding, bias, or chance and a significant risk that the relationship is not causal

3 Non-analytical studies; e.g., case reports, case series

4 Expert opinion

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Reviewing and Grading of Evidence

Once the evidence has been collated for each clinical question it needs to be appraised and reviewed (refer to section 3 in "Development of RCOG Green-top guidelines: producing a clinical practice guideline" for information on the formulation of the clinical questions; see the "Availability of Companion Documents" field). For each question, the study type with least chance of bias should be used. If available, randomised controlled trials (RCTs) of suitable size and quality should be used in preference to observational data. This may vary depending on the outcome being examined.

The level of evidence and the grade of the recommendations used in this guideline originate from the guidance by the Scottish Intercollegiate Guidelines Network (SIGN) Grading Review Group, which incorporates formal assessment of the methodological quality, quantity, consistency, and applicability of the evidence base. The methods used to appraise individual study types are available from the SIGN Web site (www.sign.ac.uk/methodology/checklists.html). An objective appraisal of study quality is essential, but paired reviewing by guideline leads may be impractical because of resource constraints.

Once evidence has been collated and appraised, it can be graded. A judgement on the quality of the evidence will be necessary using the grading system (see the "Rating Scheme for the Strength of the Evidence" field). Where evidence is felt to warrant 'down-grading', for whatever reason, the rationale must be stated. Evidence judged to be of poor quality can be excluded. Any study with a high chance of bias (either 1– or 2–) will be excluded from the guideline and recommendations will not be based on this evidence. This prevents recommendations being based on poor-quality RCTs when higher-quality observational evidence is available.

Methods Used to Formulate the Recommendations

Expert Consensus

Informal Consensus

Description of Methods Used to Formulate the Recommendations

Guideline Development

The development of guidelines involves more than the collation and reviewing of evidence. Even with high-quality data from systematic reviews of randomised controlled trials, a value judgement is needed when comparing one therapy with another. This will therefore introduce the need for consensus.

Royal College of Obstetricians and Gynaecologists (RCOG) Green-top guidelines are drafted by nominated developers, in contrast to other guideline groups such as the National Institute for Health and Clinical Excellence (NICE) and the Scottish Intercollegiate Guidelines Network (SIGN), who use larger guideline development groups. Equally, in contrast to other guideline groups, the topics chosen for development as Green-top guidelines are concise enough to allow development by a smaller group of individuals.

In agreeing the precise wording of evidence-based guideline recommendations and in developing consensus-based 'good practice points', the Guidelines Committee (GC) will employ an informal consensus approach through group discussion. In line with current methodologies, the entire development process will follow strict guidance and be both transparent and robust. The RCOG acknowledges that formal consensus methods have been described but these require further evaluation in the context of clinical guideline development. It is envisaged that this will not detract from the rigor of the process but prevent undue delays in development.

Rating Scheme for the Strength of the Recommendations

Grades of Recommendations

A - At least one meta-analysis, systematic review or randomised controlled trial rated as 1++ and directly applicable to the target population; *or*

A systematic review of randomised controlled trials or a body of evidence consisting principally of studies rated as 1+ directly applicable to the target population and demonstrating overall consistency of results

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Extrapolated evidence from studies rated as 2++

D - Evidence level 3 or 4; *or*

Extrapolated evidence from studies rated as 2+

Good Practice Point - Recommended best practice based on the clinical experience of the guideline development group

Cost Analysis

A formal cost analysis was not performed and published cost analyses were not reviewed.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Following discussion in the Guidelines Committee (GC), each Green-top guideline is formally peer reviewed. At the same time, the draft guideline is published on the Royal College of Obstetricians and Gynaecologists (RCOG) Web site for further peer discussion before final publication.

All comments will be collated by the RCOG and tabulated for consideration by the guideline leads. Each comment will require discussion. Where comments are rejected then justification will need to be made. Following this review, the document will be updated and the GC will then review the revised draft and the table of comments.

Once the GC signs-off on the guideline, it is submitted to the Standards Board for approval before final publication.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Potential Harms

- Vacuum and forceps delivery can be associated with significant complications, both maternal and fetal. Two maternal deaths have been described in association with tearing of the cervix at vacuum delivery and a further maternal death has been described following uterine rupture in association with forceps delivery. Neonatal intracranial and subgaleal haemorrhage are life-threatening complications of particular concern. In a review of 583,340 liveborn singleton infants born to nulliparous women, the rate of subdural or cerebral haemorrhage in vacuum deliveries (one in 860) did not differ significantly from that associated with forceps use (one in 664) or caesarean section during labour (one in 954).
- In 1998, the US Food and Drug Administration issued a warning about the potential dangers of delivery with vacuum extractor. This followed several reports of infant fatality secondary to intracranial haemorrhage. In addition, there has been a growing awareness of the short-term and long-term morbidity of pelvic floor injury as well as neurodevelopmental outcomes for children following operative vaginal delivery. Caesarean section in the second stage of labour is an alternative approach but also carries significant morbidity and implications for future births. The goal should be to minimise the risk of morbidity and, where morbidity occurs, to minimise the likelihood of serious harm while maximising maternal choice.
- Vacuum extraction compared with forceps is:
    - More likely to fail delivery with the selected instrument (odds ratio [OR] 1.7; 95% confidence interval [CI] 1.3–2.2)
    - More likely to be associated with cephalohaematoma (OR 2.4; 95% CI 1.7–3.4)
    - More likely to be associated with retinal haemorrhage (OR 2.0; 95% CI 1.3–3.0)
    - More likely to be associated with maternal worries about baby (OR 2.2; 95% CI 1.2–3.9)
    - Less likely to be associated with significant maternal perineal and vaginal trauma (OR 0.4; 95% CI 0.3–0.5)
    - No more likely to be associated with delivery by caesarean section (OR 0.6; 95% CI 0.3–1.0)
    - No more likely to be associated with low 5-minute Apgar scores (OR 1.7; 95% CI 1.0–2.8)
    - No more likely to be associated with the need for phototherapy (OR 1.1; 95% CI 0.7–1.8).
- There is an increased risk of neonatal trauma associated with sequential use of instruments (risk of intracranial haemorrhage one in 256 deliveries for two instruments versus one in 334 for failed forceps proceeding to caesarean section).
- Operative delivery, prolonged labour, and epidural analgesia may predispose to postpartum urinary retention, which can be associated with long-term bladder dysfunction.
- Urinary incontinence is common after operative vaginal delivery.
- Operative vaginal delivery can be associated with fear of subsequent childbirth and in a severe form may manifest as a post-traumatic stress-type syndrome termed tocophobia.

Contraindications

Contraindications

- Fetal bleeding disorders (e.g., alloimmune thrombocytopenia) or a predisposition to fracture (e.g., osteogenesis imperfecta) are relative contraindications to operative vaginal delivery. However, there may be considerable fetal risk if the head has to be delivered abdominally from deep in the pelvis.
- Blood-borne viral infections of the mother are not a contraindication to operative vaginal delivery. However, it is sensible to avoid difficult operative delivery where there is an increased chance of fetal abrasion or scalp trauma and to avoid fetal scalp clips or blood sampling during labour.
- Vacuum extractors are contraindicated with a face presentation. It has been suggested that vacuum extractors should not be used at gestations of less than 36 weeks because of the risk of subgaleal and intracranial haemorrhage. Below 34 weeks +0 days of gestation, the use of vacuum extraction is not recommended because of the susceptibility of the preterm infant to cephalohaematoma, intracranial haemorrhage, subgaleal haemorrhage, and neonatal jaundice.
- Forceps and vacuum extractor deliveries before full dilatation of the cervix are contraindicated.

Qualifying Statements

Qualifying Statements

- These recommendations are not intended to dictate an exclusive course of management or treatment. They must be evaluated with reference to individual patient needs, resources and limitations unique to the institution and variations in local populations. It is hoped that this process of local ownership will help to incorporate these guidelines into routine practice. Attention is drawn to areas of clinical uncertainty where further research may be indicated.
- The Royal College of Obstetricians and Gynaecologists (RCOG) produces guidelines as an educational aid to good clinical practice. They present recognised methods and techniques of clinical practice, based on published evidence, for consideration by obstetricians and gynaecologists and other relevant health professionals. The ultimate judgement regarding a particular clinical procedure or treatment plan must be made by the doctor or other attendant in the light of clinical data presented by the patient and the diagnostic and treatment options available within the appropriate health services.
- This means that RCOG Guidelines are unlike protocols or guidelines issued by employers, as they are not intended to be prescriptive directions defining a single course of management. Departure from the local prescriptive protocols or guidelines should be fully documented in the patient's case notes at the time the relevant decision is taken.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Implementation Tools

Audit Criteria/Indicators

Chart Documentation/Checklists/Forms

Patient Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Royal College of Obstetricians and Gynaecologists (RCOG). Operative vaginal delivery. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2011 Jan. 19 p. (Green-top guideline; no. 26). [99 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2000 Oct (revised 2011 Jan)

Guideline Developer(s)

Royal College of Obstetricians and Gynaecologists - Medical Specialty Society

Source(s) of Funding

Royal College of Obstetricians and Gynaecologists

Guideline Committee

Guidelines Committee

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Financial Disclosures/Conflicts of Interest

Conflicts of interest: none declared.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Royal College of Obstetricians and Gynaecologists (RCOG). Operative vaginal delivery. London (UK): Royal College of Obstetricians and Gynaecologists (RCOG); 2005 Oct. 13 p. (Guideline; no. 26).

Guideline Availability

Electronic copies: Available from the Royal College of Obstetricians and Gynaecologists (RCOG) Web site .

Availability of Companion Documents

The following are available:

- Development of RCOG green-top guidelines: policies and processes. Clinical Governance Advice No 1a. 2006 Nov. Available from the Royal College of Obstetricians and Gynaecologists (RCOG) Web site.
- Development of RCOG green-top guidelines: producing a scope. Clinical Governance Advice No 1b. 2006 Nov. Available from the RCOG Web site.
- Development of RCOG green-top guidelines: producing a clinical practice guideline. Clinical Governance Advice No 1c. 2006 Nov. Available from the RCOG Web site.
- Development of RCOG green-top guidelines: consensus methods for adaptation of green-top guidelines. Governance Advice No. 1d. 2010 Feb. Available from the RCOG Web site.

Appendix 1 of the original guideline document contains a sample operative vaginal delivery record.

In addition, auditable standards can be found in section 7 of the original guideline document.

Patient Resources

The following is available:

- An assisted birth (operative vaginal delivery): information for you. Royal College of Obstetricians and Gynaecologists. 2007 Nov. 4 p. Electronic copies: Available from the Royal College of Obstetricians and Gynaecologists (RCOG) Web site.

Please note: This patient information is intended to provide health professionals with information to share with their patients to help them better understand their health and their diagnosed disorders. By providing access to this patient information, it is not the intention of NGC to provide specific medical advice for particular patients. Rather we urge patients and their representatives to review this material and then to consult with a licensed health professional for evaluation of treatment options suitable for them as well as for diagnosis and answers to their personal medical questions. This patient information has been derived and prepared from a guideline for health care professionals included on NGC by the authors or publishers of that original guideline. The patient information is not reviewed by NGC to establish whether or not it accurately reflects the original guideline's content.

NGC Status

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